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# NUTRITION AND HEALTH INFO SHEET

## Calcium

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### What function does calcium have in the body?

Calcium is a mineral used for numerous functions, including building bones and teeth, muscle contraction, blood clotting, maintenance of cell membranes, and nerve transmission.<sup>1</sup> Because most of the calcium in the body is found in the skeleton, calcium's critical function in maintaining bone health receives much attention.

### What are the effects of calcium deficiency?

Adequate intake of calcium is essential for maximizing bone density. Therefore, an inadequate intake of calcium can adversely influence bone formation and may contribute to osteoporosis. Osteoporosis is a decrease in bone density and strength that results in increased susceptibility to bone fractures. It is a debilitating disease most commonly found in postmenopausal women; however, men are also at risk for this disease. In the United States osteoporosis affects an estimated 35 percent of postmenopausal Caucasian women.<sup>2</sup> Osteoporosis cannot be cured; it can only be prevented or its progression delayed. The best ways to prevent the disease are to build strong bones early in life by eating a well-balanced, calcium-rich diet, and by making weight-bearing exercise a regular routine.

### How much calcium should be consumed each day?

The Dietary Reference Intakes (DRIs) for calcium<sup>3</sup> aim to ensure that individuals will be able to maximize peak adult bone mass, maintain adult bone mass, and minimize bone loss in later years.<sup>4</sup> The DRIs may be revised further as more calcium research is performed. [Table 1](#) shows the current recommendations for calcium intake.

### Is it risky to consume too much calcium?

It is difficult to consume too much calcium through food sources. In fact, most people do not consume adequate amounts of this nutrient. It is best to obtain calcium through dietary sources and to limit supplements so that the DRIs are not exceeded. The DRI committee also established Tolerable Upper Intake Levels (ULs), listed in [table 1](#). At calcium intakes above the UL, serious side effects may occur, including severe renal damage and abnormal calcium deposition in the body's soft tissue. Some individuals may also develop hypercalcemia (excessive amounts of calcium in the blood) or hypercalciuria (excessive amounts of calcium in the urine).<sup>5</sup> It should be stressed that the UL is not an intake goal; rather, it is recognized to be the maximum intake that the body can safely tolerate. Serious side effects may occur at higher levels. Consuming calcium in excess of the DRI is unnecessary and may interfere with the absorption of essential nutrients, such as iron, and with the efficacy of medications such as tetracycline.

### What are good sources of calcium?

Dairy products (milk, cheese, yogurt, etc.) are the most concentrated food sources of calcium (e.g. one cup of milk contains approximately 271 mg of calcium). (See the



Table 1. Current recommendations for calcium intake for various age groups

Age group and pregnant or lactating women	USDA MyPyramid recommended servings of milk group foods per day* (cups)	Current calcium intake recommendation per day (Adequate Intake) <sup>†</sup> (mg)	Tolerable upper intake level (UL) per day <sup>‡</sup> (mg)
<b>Infants</b>			
birth to 6 mo	No recommendation	210	not established
7–12 mo	No recommendation	270	not established
<b>Children</b>			
1–3 yr	2 (for children 2 and older)	500	2,500
4–8 yr	2	800	2,500
<b>Adolescents</b>			
9–13 yr	3	1,300	2,500
14–18 yr	3	1,300	2,500
<b>Adults</b>			
19–30 yr	3	1,000	2,500
31–50 yr	3	1,000	2,500
51–70 yr	3	1,200	2,500
>70		1,200	2,500
<b>Pregnant women</b>			
≤18 yr	3	1,300	2,500
19–50 yr	3	1,000	2,500
<b>Lactating women</b>			
≤18 yr	3	1,300	2,500
19–50 yr	3	1,000	2,500

Source: Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, Food and Nutrition Board, Institute of Medicine. 1997. Dietary reference intakes for calcium, phosphorus, magnesium, vitamin D, and fluoride. Washington, DC: National Academy Press.

Notes:

\*MyPyramid.gov Web site, [www.mypyramid.gov](http://www.mypyramid.gov).

<sup>†</sup>Standing Committee 1997, p. 15.

<sup>‡</sup>Ibid., p. 20.

metric conversion table at the end of this publication.) Even individuals who are lactose intolerant are usually able to eat small amounts of dairy products such as yogurt, cheese, and lactase-treated milk.

Individuals who avoid dairy products due to allergies may select nondairy foods that contain calcium, such as beans, tofu (if processed with calcium sulfate), broccoli, and kale. However, it is difficult to absorb the same amount of calcium from these nondairy alternatives as from dairy products because the overall calcium concentrations and bioavailabilities are lower.<sup>6</sup> Calcium-rich and calcium-fortified foods, as illustrated in table 2, are the preferred choices for obtaining calcium because additional nutrients (e.g. vitamin D in milk) also contribute to bone development and maintenance of bone health. Check food labels to find out the percentage of calcium in processed foods. Every 10 percent of the calcium Daily Value (DV), a dietary reference term listed on the label, is equivalent to approximately 100 mg of calcium. For those who are unable to obtain sufficient calcium through their diet, supplements such as calcium citrate or calcium carbonate are recommended.<sup>7</sup>

## What are some calcium-rich food sources?

Table 2. Calcium-rich food sources<sup>8</sup>

	Serving size	Calcium (mg)	Calories
<b>Dairy foods</b>			
milk (2% milk fat)	1 cup	271	122
cottage cheese (2% milk fat)	1 cup	156	203
mozzarella cheese (part skim, low moisture)	1 oz	222	72
cheddar cheese (natural, not processed)	1.5 oz	303	170
cream cheese (regular, plain)	1 oz	23	99
yogurt (plain, skim milk)	8 oz	452	127
<b>Nondairy foods</b>			
tofu (firm, only if processed with calcium sulfate)	1/2 cup	861	183
sardines (with bones, in oil, drained)	3 oz	324	177
salmon (pink, with bones, in water, drained)	3 oz	181	118
orange juice (calcium fortified)	1 cup	253	137
broccoli (fresh, steamed)	1 cup	88	19
kale (scotch, fresh, chopped, steamed)	1 cup	172	36

## REFERENCES

1. Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, Food and Nutrition Board, Institute of Medicine. 1997. Dietary reference intakes for calcium, phosphorus, magnesium, vitamin D, and fluoride. Washington, DC: National Academy Press. 71.
2. U.S. Department of Health and Human Services. 2004. Bone health and osteoporosis: A report of the Surgeon General. DHHS Web site, <http://www.surgeongeneral.gov/library/bonehealth/content.html>.
3. Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, Food and Nutrition Board, Institute of Medicine. 1997. Dietary reference intakes for calcium, phosphorus, magnesium, vitamin D, and fluoride. Washington, DC: National Academy Press. 93–127.
4. *Ibid.*, p. 107.
5. *Ibid.*, p. 134.
6. *Ibid.*, pp. 73–74.
7. *Ibid.*, pp. 74, 81–82.
8. USDA, Agricultural Research Service, USDA Nutrient Data Laboratory. 2006. USDA National Nutrient Database for Standard Reference, Release 19. USDA Nutrient Data Laboratory Web site, <http://www.nal.usda.gov/fnic/foodcomp/search/>.

## METRIC CONVERSIONS

English	Conversion factor for English to metric	Conversion factor for metric to English	Metric
grain	64.80	0.015	milligram (mg)
fluid ounce (fl oz)	29.57	0.034	milliliter (ml)
fluid ounce (fl oz)	2.96	0.0034	deciliter (d)
ounce (oz)	28.35	0.035	gram (g)
cup	236.6	0.004	milliliter (ml)

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